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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	HOUNG JOONG KIM ET AL.	
Serial No.:	[NEW]	Group Art Unit: [To be assigned]
Filed:	FEBRUARY 27, 2002	Examiner: [To be assigned]
Title:	WASHING MACHINE	

PRELIMINARY AMENDMENT

Box PATENT APPLICATION
Commissioner for Patents
Washington, D.C. 20231

Sir:

Please enter the following amendments to the specification, claims and abstract prior to the examination of the application.

IN THE CLAIMS:

Please amend claims 3-15 as follows:

(A marked-up version of amended claims 3-15 is attached to this Preliminary Amendment).

3. (Amended) A washing machine according to claim 1, which uses an electric motor comprising:

said mechanism for changing the magnetic pole centers depending on change in the direction of torque, said mechanism being constructed so that said first field magnet may be fixed to a shaft, and said second field magnet may

be separated from said shaft, and said shaft and said second field magnet have screw functions to be connected to each other by forming a bolt screw portion in said shaft and a nut portion inside said second field magnet;

a stopper at a position apart from a side surface of said second field magnet; and

a servomechanism capable of moving said stopper in parallel to said shaft according to a rotating speed of said motor.

4. (Amended) An electric motor according to claim 1, wherein a lead angle of current supply by a controller for controlling said controller is corrected according to a positional shift of a composite magnetic pole of said first field magnet and said second field magnet.

5. (Amended) An electric motor according to claim 1, wherein said first field magnet is fixed to a shaft, said second field magnet is separated from said shaft, said shaft and said second field magnet have screw functions to be connected to each other by forming a bolt screw portion in said shaft and a nut portion inside said second field magnet, a displacement in an axial direction of said second field magnet is detected, and a lead angle of current supply by a controller for controlling said inverter is corrected corresponding to a positional shift angle of a composite magnetic pole of said first field magnet and said second field magnet.

6. (Amended) An electric motor according to claim 1, wherein said first field magnet is fixed to a shaft, said second field magnet is separated from said shaft, and a plurality of supporting mechanisms capable of guiding rotational motion and reciprocal motion and the composite motion of said second field magnet is arranged between said second field magnet and said shaft.

7. (Amended) A rotary electric machine according to claim 1, wherein said first field magnet is fixed to a shaft, said second field magnet is separated from said shaft, and a sleeve is inserted between the inside of said second filed magnet and said shaft to fix said second field magnet to said sleeve.

8. (Amended) A rotary electric machine according to claim 7, wherein said sleeve is made of a non-magnetic material having an electric resistivity higher than that of iron.

9. (Amended) An electric motor according to claim 1, wherein said first field magnet is fixed to a shaft, said second field magnet is separated from said shaft, a plurality of springs is arranged before and after said second field magnet to guide the rotational motion and the reciprocal motion and the composite motion of said second field magnet.

10. (Amended) An electric motor according to claim 1, wherein said first field magnet is fixed to a shaft, said second field magnet is separated from said shaft, a depressing portion is formed on a side surface of said first field

magnet where said first field magnet and said second field magnet are in contact with each other, a projecting portion also serving as a function of said sleeve is formed in said second field magnet.

11. (Amended) An electric motor according to claim 1, wherein said first field magnet is fixed to a shaft, said second field magnet is separated from said shaft, and a stopper is arranged at a position apart from a side surface of said second field magnet, said stopper having a supporting mechanism for guiding rotational motion and reciprocal motion and the composite motion to said second field magnet and said shaft.

12. (Amended) An electric motor according to claim 1, wherein said first field magnet is fixed to a shaft, said second field magnet is separated from said shaft, an air gap between said rotor having said second field magnet and said stator is larger than an air gap between the rotor having said first field magnet and said stator.

13. (Amended) An electric motor according to claim 1, wherein said first and said second field magnets are opposite to the magnetic poles of said stator, and said first and said second field magnets are relatively movable in the axial direction.

14. (Amended) A washing machine according to claim 1, wherein said electric motor is operated by making positions of the magnetic pole centers of

said first field magnet and said second field magnet in phase during low speed operation, and by making the positions of the magnetic pole centers of said first field magnet and said second field magnet out of phase during high speed and low load operation.

15. (Amended) A washing machine according to claim 1, wherein said electric motor is operated by making positions of the magnetic pole centers of said first field magnet and said second field magnet in phase during said washing or rinsing operation, and by making the positions of the magnetic pole centers of said first field magnet and said second field magnet out of phase during spin-drying operation.

Add the following new claims:

16. (New) A washing machine according to claim 2, which uses an electric motor wherein:

said mechanism for changing the magnetic pole centers depending on change in the direction of torque is constructed so that said first field magnet may be fixed to a shaft, and said second field magnet may be separated from said shaft, and said shaft and said second field magnet have screw functions to be connected to each other by forming a bolt screw portion in said shaft and a nut portion inside said second field magnet;

a stopper at a position apart from a side surface of said second field magnet; and

a servomechanism capable of moving said stopper in parallel to said shaft according to a rotating speed of said motor.

17. (New) An electric motor according to claim 16, wherein a lead angle of current supply by a controller for controlling said controller is corrected according to a positional shift of a composite magnetic pole of said first field magnet and said second field magnet.

18. (New) An electric motor according to claim 16, wherein said first field magnet is fixed to a shaft, said second field magnet is separated from said shaft, said shaft and said second field magnet have screw functions to be connected to each other by forming a bolt screw portion in said shaft and a nut portion inside said second field magnet, a displacement in an axial direction of said second field magnet is detected, and a lead angle of current supply by a controller for controlling said inverter is corrected corresponding to a positional shift angle of a composite magnetic pole of said first field magnet and said second field magnet.

19. (New) An electric motor according to claim 16, wherein said first field magnet is fixed to a shaft, said second field magnet is separated from said shaft, and a plurality of supporting mechanisms capable of guiding rotational motion and reciprocal motion and the composite motion of said second field magnet is arranged between said second field magnet and said shaft.

20. (New) A rotary electric machine according to claim 16, wherein said first field magnet is fixed to a shaft, said second field magnet is separated from said shaft, and a sleeve is inserted between the inside of said second filed magnet and said shaft to fix said second field magnet to said sleeve.

21. (New) A rotary electric machine according to claim 20, wherein said sleeve is made of a non-magnetic material having an electric resistivity higher than that of iron.

22. (New) An electric motor according to claim 16, wherein said first field magnet is fixed to a shaft, said second field magnet is separated from said shaft, a plurality of springs is arranged before and after said second field magnet to guide the rotational motion and the reciprocal motion and the composite motion of said second field magnet.

23. (New) An electric motor according to claim 16, wherein said first field magnet is fixed to a shaft, said second field magnet is separated from said shaft, a depressing portion is formed on a side surface of said first field magnet where said first field magnet and said second field magnet are in contact with each other, a projecting portion also serving as a function of said sleeve is formed in said second field magnet.

24. (New) An electric motor according to claim 16, wherein said first field magnet is fixed to a shaft, said second field magnet is separated from said

shaft, and a stopper is arranged at a position apart from a side surface of said second field magnet, said stopper having a supporting mechanism for guiding rotational motion and reciprocal motion and the composite motion to said second field magnet and said shaft.

25. (New) An electric motor according to claim 16, wherein said first field magnet is fixed to a shaft, said second field magnet is separated from said shaft, an air gap between said rotor having said second field magnet and said stator is larger than an air gap between the rotor having said first field magnet and said stator.

26. (New) An electric motor according to claim 16, wherein said first and said second field magnets are opposite to the magnetic poles of said stator, and said first and said second field magnets are relatively movable in the axial direction.

27. (New) A washing machine according to claim 16, wherein said electric motor is operated by making positions of the magnetic pole centers of said first field magnet and said second field magnet in phase during low speed operation, and by making the positions of the magnetic pole centers of said first field magnet and said second field magnet out of phase during high speed and low load operation.

REMARKS

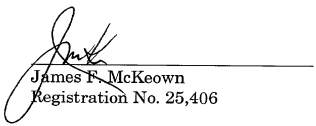
Entry of the amendments to the claims before examination of the application is respectfully requested. The claims have been amended to remove multiple dependencies.

If there are any questions regarding this Preliminary Amendment or the application in general, a telephone call to the undersigned would be appreciated since this should expedite the prosecution of the application for all concerned.

If necessary to effect a timely response, this paper should be considered as a petition for an Extension of Time sufficient to effect a timely response, and please charge any deficiency in fees or credit any overpayments to Deposit Account No. 05-1323 (Docket #381NP/50950).

Respectfully submitted,

February 27, 2002



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VERSION WITH MARKINGS TO SHOW CHANGES

3. (Amended) A washing machine according to claim 1 [or 2], which uses an electric motor comprising:

said mechanism for changing the magnetic pole centers depending on change in the direction of torque, said mechanism being constructed so that said first field magnet may be fixed to a shaft, and said second field magnet may be separated from said shaft, and said shaft and said second field magnet have screw functions to be connected to each other by forming a bolt screw portion in said shaft and a nut portion inside said second field magnet;

a stopper at a position apart from a side surface of said second field magnet; and

a servomechanism capable of moving said stopper in parallel to said shaft according to a rotating speed of said motor.

4. (Amended) An electric motor according to [any one of] claim 1 [to claim 3], wherein a lead angle of current supply by a controller for controlling said controller is corrected according to a positional shift of a composite magnetic pole of said first field magnet and said second field magnet.

5. (Amended) An electric motor according to [any one of] claim 1 [to claim 3], wherein said first field magnet is fixed to a shaft, said second field magnet is separated from said shaft, said shaft and said second field magnet have screw functions to be connected to each other by forming a bolt screw portion in said shaft and a nut portion inside said second field magnet, a

displacement in an axial direction of said second field magnet is detected, and a lead angle of current supply by a controller for controlling said inverter is corrected corresponding to a positional shift angle of a composite magnetic pole of said first field magnet and said second field magnet.

6. (Amended) An electric motor according to [any one of] claim 1 [to claim 3], wherein said first field magnet is fixed to a shaft, said second field magnet is separated from said shaft, and a plurality of supporting mechanisms capable of guiding rotational motion and reciprocal motion and the composite motion of said second field magnet is arranged between said second field magnet and said shaft.

7. (Amended) A rotary electric machine according to [any one of] claim 1 [to claim 3], wherein said first field magnet is fixed to a shaft, said second field magnet is separated from said shaft, and a sleeve is inserted between the inside of said second filed magnet and said shaft to fix said second field magnet to said sleeve.

8. (Amended) A rotary electric machine according to claim [8] 7, wherein said sleeve is made of a non-magnetic material having an electric resistivity higher than that of iron.

9. (Amended) An electric motor according to [any one of] claim 1 [to claim 3], wherein said first field magnet is fixed to a shaft, said second field

magnet is separated from said shaft, a plurality of springs is arranged before and after said second field magnet to guide the rotational motion and the reciprocal motion and the composite motion of said second field magnet.

10. (Amended) An electric motor according to [any one of] claim 1 [to claim 3], wherein said first field magnet is fixed to a shaft, said second field magnet is separated from said shaft, a depressing portion is formed on a side surface of said first field magnet where said first field magnet and said second field magnet are in contact with each other, a projecting portion also serving as a function of said sleeve is formed in said second field magnet.

11. (Amended) An electric motor according to [any one of] claim 1 [to claim 3], wherein said first field magnet is fixed to a shaft, said second field magnet is separated from said shaft, and a stopper is arranged at a position apart from a side surface of said second field magnet, said stopper having a supporting mechanism for guiding rotational motion and reciprocal motion and the composite motion to said second field magnet and said shaft.

12. (Amended) An electric motor according to [any one of] claim 1 [to claim 3], wherein said first field magnet is fixed to a shaft, said second field magnet is separated from said shaft, an air gap between said rotor having said second field magnet and said stator is larger than an air gap between the rotor having said first field magnet and said stator.

13. (Amended) An electric motor according to [any one of] claim 1 [to claim 3], wherein said first and said second field magnets are opposite to the magnetic poles of said stator, and said first and said second field magnets are relatively movable in the axial direction.

14. (Amended) A washing machine according to [any one of] claim 1 [to claim 3], wherein said electric motor is operated by making positions of the magnetic pole centers of said first field magnet and said second field magnet in phase during low speed operation, and by making the positions of the magnetic pole centers of said first field magnet and said second field magnet out of phase during high speed and low load operation.

15. (Amended) A washing machine according to [any one of] claim 1 [to claim 3], wherein said electric motor is operated by making positions of the magnetic pole centers of said first field magnet and said second field magnet in phase during said washing or rinsing operation, and by making the positions of the magnetic pole centers of said first field magnet and said second field magnet out of phase during spin-drying operation.